

CLAIMS

1. Device for coupling a driving shaft (2) and a driven shaft (3) which are intended to rotate with respect to a casing (4) in the continuation of one another substantially about an axis (1), the device comprising a dog clutch (9) allowing the driving shaft (2) to drive the driven shaft (3) and declutching means allowing the dog clutch (9) to be uncoupled from a clutch-engaged position to a declutched position, characterized in that the declutching means comprise at least one first channel (13) secured to a driving element (12) of the dog clutch (9), the first channel (13) having the shape of a portion of a torus about the axis (1), at least one second channel (16) secured to the driving shaft (2), the second channel (16) having a helical shape about the axis (1), and a rolling element (17) intended to roll between the first (13) and in the second channel (16).

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2. The coupling device as claimed in claim 1, characterized in that the rolling element (17) is a spherical ball and in that a cross section of each channel (13, 16) is a portion of a circle of radius more or less equal to that of the spherical ball.

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3. The coupling device as claimed in one of the preceding claims, characterized in that it comprises three first channels (13) distributed uniformly about the axis (1), three second channels (16) distributed in the same way as the three first channels (13), and three rolling elements (17).

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4. The coupling device as claimed in one of the preceding claims, characterized in that the dog clutch (9) comprises a first series of teeth (10) secured to the driving shaft (2) and a second series of teeth (11) secured to the driven shaft (3), the teeth in each

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series have complementing triangular shapes, the shapes are produced in such a way that when the driving shaft (2) drives the driven shaft (3) a continuation of each contacting surface of each series of teeth contains the
5 axis (1).

5. The device as claimed in one of the preceding claims, characterized in that it comprises a brake (21) intended to slow the driving element (12) in its
10 rotation with respect to the driving shaft (2).

6. The device as claimed in claim 5, characterized in that the brake (21) is of the reluctance type.

15 7. The device as claimed in claim 6, characterized in that the brake (21) comprises a plurality of slots (22) made in a magnetic material belonging to the driving element (12), a plurality of permanent magnets (23) secured to the casing (4) and in interaction with the
20 magnetic material.

8. The device as claimed in one of the preceding claims, characterized in that it comprises means allowing the driving element (12) to rotate in just one
25 direction of rotation about the axis (1).

9. The device as claimed in claim 8 by way of a claim dependent on claim 7, characterized in that the means that allow the driving element (12) to rotate in just
30 one direction of rotation about the axis (1) comprise at least one roller (27) free to rotate with respect to a cage (28) secured to the casing (4), a surface of revolution (29) belonging to the driving shaft (2) and the axis of which is coincident with the axis (1) of
35 rotation of the driving element (12), a ramp (30) belonging to the casing (4) and inclined with respect to a tangent in the surface of revolution (29) at a region on the surface of revolution where the roller

(27) is liable to roll, and an elastic element (31) opposing the movement of the roller (27) along the ramp (30).

- 5 10. The device as claimed in claim 9, characterized in that the surface of revolution (29) is near the slots (22) and the solid parts (26) so that there can be magnetic interaction between the rollers (27) and the surface of revolution.